

# SEQUENCE LISTING

<110> Snutch, Terry P.  
Baillie, David L.

<120> NOVEL HUMAN CALCIUM CHANNELS AND RELATED PROBES, CELL  
LINES AND METHODS

<130> NMED.P-001-2(CIP)

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<151> 1998-02-25

<150> 60/039,204

<151> 1997-02-28

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<170> PatentIn Ver. 2.0

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005020-070500



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805

810

815

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Asp Leu Cys Met Thr Leu Lys Ala Pro Cys Leu Cys His Asn Val Pro  
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005020-2511560

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Thr Ala Ile Phe Val Gly Glu Met Thr Leu Lys Val Val Ser Leu Gly		
1555	1560	1565
Leu Tyr Phe Gly Glu Gln Ala Tyr Leu Arg Ser Ser Trp Asn Val Leu		

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1570	1575	1580
Asp Gly Phe Leu Val Phe Val Ser Ile Ile Asp Ile Val Val Ser Leu		
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Ala Ser Ala Gly Gly Ala Lys Ile Leu Gly Val Leu Arg Val Leu Arg		
1605	1610	1615
Leu Leu Arg Thr Leu Arg Pro Leu Arg Val Ile Ser Arg Ala Pro Gly		
1620	1625	1630
Leu Lys Leu Val Val Glu Thr Leu Ile Ser Ser Leu Lys Pro Ile Gly		
1635	1640	1645
Asn Ile Val Leu Ile Cys Cys Ala Phe Phe Ile Ile Phe Gly Ile Leu		
1650	1655	1660
Gly Val Gln Leu Phe Lys Gly Lys Phe Tyr His Cys Leu Gly Val Asp		
1665	1670	1675 1680
Thr Arg Asn Ile Thr Asn Arg Ser Asp Cys Met Ala Ala Asn Tyr Arg		
1685	1690	1695
Trp Val His His Lys Tyr Asn Phe Asp Asn Leu Gly Gln Ala Leu Met		
1700	1705	1710
Ser Leu Phe Val Leu Ala Ser Lys Asp Gly Trp Val Asn Ile Met Tyr		
1715	1720	1725
Asn Gly Leu Asp Ala Val Ala Val Asp Gln Gln Pro Val Thr Asn His		
1730	1735	1740
Asn Pro Trp Met Leu Leu Tyr Phe Ile Ser Phe Leu Leu Ile Val Ser		
1745	1750	1755 1760
Phe Phe Val Leu Asn Met Phe Val Gly Val Val Val Glu Asn Phe His		
1765	1770	1775
Lys Cys Arg Gln His Gln Glu Ala Glu Glu Ala Arg Arg Arg Glu Glu		
1780	1785	1790
Lys Arg Leu Arg Arg Leu Glu Lys Lys Arg Arg Lys Ala Gln Arg Leu		
1795	1800	1805
Pro Tyr Tyr Ala Thr Tyr Cys His Thr Arg Leu Leu Ile His Ser Met		
1810	1815	1820
Cys Thr Ser His Tyr Leu Asp Ile Phe Ile Thr Phe Ile Ile Cys Leu		

1825

1830

1835

1840

Asn Val Val Thr Met Ser Leu Glu His Tyr Asn Gln Pro Thr

1845

1850

&lt;210&gt; 19

&lt;211&gt; 567

&lt;212&gt; DNA

&lt;213&gt; HUMAN

&lt;220&gt;

&lt;223&gt; human alpha-I partial sequence

&lt;400&gt; 19

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&lt;210&gt; 20

&lt;211&gt; 189

&lt;212&gt; PRT

&lt;213&gt; HUMAN

&lt;220&gt;

&lt;223&gt; human alpha-I partial sequence

&lt;400&gt; 20

Met Arg Ile Leu Val Asn Leu Leu Leu Asp Thr Leu Pro Met Leu Gly  
 1 5 10 15

Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Thr Phe Gly Ile Ile  
 20 25 30

Gly Val Gln Leu Trp Ala Gly Leu Leu Arg Asn Arg Cys Phe Leu Glu  
 35 40 45

Glu Asn Phe Thr Ile Gln Gly Asp Val Ala Leu Pro Pro Tyr Tyr Gln  
 50 55 60

Pro Glu Glu Asp Asp Glu Met Pro Phe Ile Cys Ser Leu Ser Gly Asp

65

70

75

80

Asn Gly Ile Met Gly Cys His Glu Ile Pro Pro Leu Lys Glu Gln Gly  
85 90 95

Arg Glu Cys Cys Leu Ser Lys Asp Asp Val Tyr Asp Phe Gly Ala Gly  
100 105 110

Arg Gln Asp Leu Asn Ala Ser Gly Leu Cys Val Asn Trp Asn Arg Tyr  
115 120 125

Tyr Asn Val Cys Arg Thr Gly Ser Ala Asn Pro His Lys Gly Ala Ile  
130 135 140

Ser Phe Asp Asn Ile Gly Tyr Ala Trp Ile Val Ile Phe Gln Val Ile  
145 150 155 160

Thr Leu Glu Gly Trp Val Ala Ile Met Tyr Tyr Val Met Asp Ala Leu  
165 170 175

Ser Phe Tyr Asn Phe Val Tyr Phe Ile Leu Leu Ile Ile  
180 185

&lt;210&gt; 21

&lt;211&gt; 567

&lt;212&gt; DNA

&lt;213&gt; rat

&lt;220&gt;

&lt;223&gt; rat alpha-I partial sequence

&lt;400&gt; 21

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&lt;210&gt; 22

&lt;211&gt; 189

&lt;212&gt; PRT

&lt;213&gt; rat



<220>

<223> rat alpha-I partial sequence

<400> 22

Met Arg Ile Leu Val Asn Leu Leu Leu Asp Thr Leu Pro Met Leu Gly  
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Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Ile Phe Gly Ile Ile  
20 25 30

Gly Val Gln Leu Trp Ala Gly Leu Leu Arg Asn Arg Cys Phe Leu Glu  
35 40 45

Glu Asn Phe Thr Ile Gln Gly Asp Val Ala Leu Pro Pro Tyr Tyr Gln  
50 55 60

Pro Glu Glu Asp Asp Glu Met Pro Phe Ile Cys Ser Leu Thr Gly Asp  
65 70 75 80

Asn Gly Ile Met Gly Cys His Glu Ile Pro Pro Leu Lys Glu Gln Gly  
85 90 95

Arg Glu Cys Cys Leu Ser Lys Asp Asp Val Tyr Asp Phe Gly Ala Gly  
100 105 110

Arg Gln Asp Leu Asn Ala Ser Gly Leu Cys Val Asn Trp Asn Arg Tyr  
115 120 125

Tyr Asn Val Cys Arg Thr Gly Asn Ala Asn Pro His Lys Gly Ala Ile  
130 135 140

Asn Phe Asp Asn Ile Gly Tyr Ala Trp Ile Val Ile Phe Gln Val Ile  
145 150 155 160

Thr Leu Glu Gly Trp Val Glu Ile Met Tyr Tyr Val Met Asp Ala His  
165 170 175

Ser Phe Tyr Asn Phe Ile Tyr Phe Ile Leu Leu Ile Ile  
180 185

<210> 23

<211> 7540

<212> DNA

<213> rat

<400> 23

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Gly Trp Thr Arg Arg Arg Met Glu Arg Ala Pro Arg Ser Arg Asp Ser
  35                      40                      45

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Pro Val Ala Ser Arg Ser Ser Thr Thr Cys Pro Gly Pro Gly Ala Ala
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Glu Gly Leu Pro Tyr Pro Ala Leu Ala Pro Val Val Phe Phe Tyr Leu  
85 90 95

Ser Gln Asp Ser Arg Pro Arg Ser Trp Cys Leu Arg Thr Val Cys Asn  
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Pro Trp Phe Glu Arg Val Ser Met Leu Val Ile Leu Leu Asn Cys Val  
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Thr Leu Gly Met Phe Arg Pro Cys Glu Asp Ile Ala Cys Asp Ser Gln  
130 135 140

Arg Cys Arg Ile Leu Gln Ala Phe Asp Asp Phe Ile Phe Ala Phe Phe  
145 150 155 160

Ala Val Glu Met Val Val Lys Met Val Ala Leu Gly Ile Phe Gly Lys  
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Lys Cys Tyr Leu Gly Asp Thr Trp Asn Arg Leu Asp Phe Phe Ile Val  
180 185 190

Ile Ala Gly Met Leu Glu Tyr Ser Leu Asp Leu Gln Asn Val Ser Phe  
195 200 205

Ser Ala Val Arg Thr Val Arg Val Leu Arg Pro Leu Arg Ala Ile Asn  
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Arg Val Pro Ser Met Arg Ile Leu Val Thr Leu Leu Leu Asp Thr Leu  
225 230 235 240

Pro Met Leu Gly Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Ile  
245 250 255

Phe Gly Ile Val Gly Val Gln Leu Trp Ala Gly Leu Leu Arg Asn Arg  
260 265 270

Cys Phe Leu Pro Glu Asn Phe Ser Leu Pro Leu Ser Val Asp Leu Glu  
275 280 285

Pro Tyr Tyr Gln Thr Glu Asn Glu Asp Glu Ser Pro Phe Ile Cys Ser  
290 295 300

Gln Pro Arg Glu Asn Gly Met Arg Ser Cys Arg Ser Val Pro Thr Leu  
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Arg Gly Glu Gly Gly Gly Gly Pro Pro Cys Ser Leu Asp Tyr Glu Thr  
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Thr Lys Gln Arg Glu Ser Gln Leu Met Arg Glu Gln Arg Val Arg Phe  
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Leu Ser Asn Ala Ser Thr Leu Ala Ser Phe Ser Glu Pro Gly Ser Cys  
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Tyr Glu Glu Leu Leu Lys Tyr Leu Val Tyr Ile Leu Arg Lys Ala Ala  
 465 470 475 480

Arg Arg Leu Ala Gln Val Ser Arg Ala Ile Gly Val Arg Ala Gly Leu  
 485 490 495

Leu Ser Ser Pro Val Ala Arg Ser Gly Gln Glu Pro Gln Pro Ser Gly  
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Ser Cys Thr Arg Ser His Arg Arg Leu Ser Val His His Leu Val His  
 515 520 525

His His His His His His His His Tyr His Leu Gly Asn Gly Thr Leu  
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 545 550 555 560

Ser Arg Arg Leu Met Leu Pro Pro Pro Ser Thr Pro Thr Pro Ser Gly  
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 Pro Pro Gly Leu Glu Glu Pro Leu Glu Gly Thr Asn Pro Asp Val Pro  
 35 40 45  
 His Pro Asp Leu Ala Pro Val Ala Phe Phe Cys Leu Arg Gln Thr Thr  
 50 55 60  
 Ser Pro Arg Asn Trp Cys Ile Lys Met Val Cys Asn Pro Trp Phe Glu  
 65 70 75 80  
 Cys Val Ser Met Leu Val Ile Leu Leu Asn Cys Val Thr Leu Gly Met  
 85 90 95  
 Tyr Gln Pro Cys Asp Asp Met Glu Cys Leu Ser Asp Arg Cys Lys Ile  
 100 105 110  
 Leu Gln Val Phe Asp Asp Phe Ile Phe Ile Phe Phe Ala Met Glu Met  
 115 120 125  
 Val Leu Lys Met Val Ala Leu Gly Ile Phe Gly Lys Lys Cys Tyr Leu

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Val Glu Tyr Ser Leu Asp Leu Gln Asn Ile Asn Leu Ser Ala Ile Arg		
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Thr Val Arg Val Leu Arg Pro Leu Lys Ala Ile Asn Arg Val Pro Ser		
	180	185 190
Leu Arg Ile Leu Val Asn Leu Leu Leu Asp Thr Leu Pro Met Leu Gly		
	195	200 205
Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Ile Phe Gly Ile Ile		
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Gly Val Gln Leu Trp Ala Gly Leu Leu Arg Asn Arg Cys Phe Leu Glu		
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Glu Asn Phe Thr Ile Gln Gly Asp Val Ala Leu Pro Pro Tyr Tyr Gln		
	245	250 255
Pro Glu Glu Asp Asp Glu Met Pro Phe Ile Cys Ser Leu Thr Gly Asp		
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Asn Gly Ile Met Gly Cys His Glu Ile Pro Pro Leu Lys Glu Gln Gly		
	275	280 285
Arg Glu Val Cys Leu Ser Lys Asp Asp Val Tyr Asp Phe Gly Ala Gly		
	290	295 300
Arg Gln Asp Leu Asn Ala Ser Gly Leu Cys Val Asn Trp Asn Arg Tyr		
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Tyr Asn Val Cys Arg Thr Gly Asn Ala Asn Pro His Lys Gly Ala Ile		
	325	330 335
Asn Phe Asp Asn Ile Gly Tyr Ala Trp Ile Val Ile Phe Gln Val Ile		
	340	345 350
Thr Leu Glu Gly Trp Val Glu Ile Met Tyr Tyr Val Met Asp Ala His		
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Ser Phe Tyr Asn Phe Ile Leu Leu Ile Ile Val Gly Ser Phe Phe Met		
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Ile Asn Leu Cys Leu Val Leu Ile Ala Thr Gln Phe Ser Glu Thr Lys		

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His	Ser	Lys	Leu	Cys	Pro	Arg	His	Ser	Pro	Leu	Asp	Pro	Thr	Pro	His	
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Thr	Leu	Val	Gln	Pro	Ile	Ser	Ala	Ile	Leu	Ala	Ser	Tyr	Pro	Ser	Ser	
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Cys	Pro	His	Cys	Gln	His	Glu	Ala	Gly	Arg	Arg	Pro	Ser	Gly	Leu	Gly	
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Ser	Thr	Asp	Ser	Gly	Gln	Glu	Gly	Ser	Gly	Ser	Gly	Gly	Ser	Ala	Glu	
				530					535				540			
Ala	Glu	Ala	Asn	Gly	Asp	Gly	Leu	Gln	Ser	Arg	Glu	Asp	Gly	Val	Ser	
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Cys	Gly	Asp	Val	Trp	Arg	Glu	Thr	Arg	Lys	Lys	Leu	Arg	Gly	Ile	Val	
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Thr	Val	Ser	Met	Gly	Ile	Glu	His	His	Glu	Gln	Pro	Glu	Glu	Leu	Thr	
				610					615				620			
Asn	Ile	Leu	Glu	Ile	Cys	Asn	Val	Val	Phe	Thr	Ser	Met	Phe	Ala	Leu	
625				630				635				640				
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645

650

655

Asn Pro Tyr Asn Ile Phe Asp Ser Ile Ile Val Ile Ile Ser Ile Trp  
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Glu Ile Val Gly Gln Ala Asp Ser Gly Leu Ser Val Leu Arg Thr Ser  
 675 680 685

Arg Leu Leu Arg Val Leu Lys Leu Val Arg Phe Met Pro Ala Leu Arg  
 690 695 700

Gln Leu Val Val Leu Met Lys Thr Met Asp Asn Val Ala Thr Phe Cys  
 705 710 715 720

Met Leu Leu Met Leu Phe Ile Phe Ile Phe Ser Ile Leu Gly Ile Asp  
 725 730 735

Ile Phe Gly Cys Lys Phe Ser Leu Arg Thr Asp Thr Gly Asp Thr Val  
 740 745 750

Pro Asp Arg Lys Asn Phe Asp Ser Leu Leu Trp Ala Ile Val Thr Val  
 755 760 765

Phe Gln Ile Leu Thr Gln Glu Asp Trp Asn Val Val Leu Tyr Asn Gly  
 770 775 780

Met Ala Ser Thr Thr Pro Trp Ala Ser Leu Tyr Phe Val Ala Leu Met  
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Thr Phe Gly Asn Tyr Val Leu Phe Asn Leu Leu Val Ala Ile Leu Val  
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Glu Gly Phe Gln Ala Glu Gly Asp Ala Asn Arg Ser Tyr Ser Asp Glu  
 820 825 830

Asp Gln Ser Ser Ser Asn Leu Glu Glu Leu Asp Lys Leu Pro Glu Gly  
 835 840 845

Leu Asp Asn Arg Arg Asp Leu Lys Leu Cys Pro Ile Pro Met Thr Pro  
 850 855 860

Asn Gly His Leu Asp Pro Ser Leu Pro Leu Gly Ala His Leu Gly Pro  
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Ala Gly Thr Met Gly Thr Ala Pro Arg Leu Ser Leu Gln Pro Asp Pro  
 885 890 895

Val Leu Val Ala Arg Asp Ser Arg Lys Ser Ser Tyr Trp Ser Leu Gly

900

905

910

Arg Met Ser Tyr Asp Gln Arg Ser Leu Ser Ser Ser Arg Ser Ser Tyr  
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Tyr Gly Pro Gly Gly Arg Ser Gly Thr Trp Ala Ser Arg Arg Ser Ser  
 930 935 940

Trp Asn Ser Leu Lys His Lys Pro Pro Ser Ala Glu His Glu Ser Leu  
 945 950 955 960

Leu Ser Gly Glu Gly Gly Gly Ser Cys Val Arg Ala Cys Glu Gly Ala  
 965 970 975

Arg Glu Glu Ala Pro Thr Arg Thr Ala Pro Leu His Ala Pro His Arg  
 980 985 990

His His Ala His His Gly Pro His Leu Ala His Arg His Arg His His  
 995 1000 1005

Arg Arg Thr Leu Ser Leu Asp Thr Arg Asp Ser Val Asp Leu Gly Glu  
 1010 1015 1020

Leu Val Pro Val Val Gly Ala His Ser Arg Ala Ala Trp Arg Gly Ala  
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Gly Gln Ala Pro Gly His Glu Asp Cys Asn Gly Arg Met Pro Asn Met  
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Ala Lys Asp Val Phe Thr Lys Met Asp Asp Arg Arg Asp Arg Gly Glu  
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Asp Glu Glu Glu Ile Asp Tyr Thr Leu Cys Phe Arg Val Arg Lys Met  
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Ile Cys Cys Val Tyr Lys Pro Asp Trp Cys Glu Val Arg Glu Asp Trp  
 1090 1095 1100

Ser Val Tyr Leu Phe Ser Pro Glu Asn Lys Phe Arg Ile Leu Cys Gln  
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Thr Ile Ile Ala His Lys Leu Phe Asp Tyr Val Val Leu Ala Phe Ile  
 1125 1130 1135

Phe Leu Asn Cys Ile Thr Ile Ala Leu Glu Arg Pro Gln Ile Glu Ala  
 1140 1145 1150

Gly Ser Thr Glu Arg Ile Phe Leu Thr Val Ser Asn Tyr Ile Phe Thr



1155

1160

1165

Ala Ile Phe Val Gly Glu Met Thr Leu Lys Val Val Ser Leu Gly Leu  
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Tyr Phe Gly Glu Gln Ala Tyr Leu Arg Thr Asp Trp Asn Val Leu Asp  
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Gly Phe Leu Val Phe Val Ser Ile Ile Asp Ile Val Val Ser Val Ala  
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Ser Ala Gly Gly Ala Lys Ile Leu Gly Val Leu Arg Leu Leu Arg Thr  
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Leu Arg Pro Leu Arg Val Ile Ser Arg Ala Pro Gly Leu Lys Leu Val  
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Val Glu Thr Leu Ile Ser Ser Leu Lys Pro Ile Gly Asn Ile Val Leu  
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Ile Cys Cys Ala Phe Phe Ile Ile Phe Gly Ile Leu Gly Val Gln Leu  
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Phe Lys Gly Lys Phe Tyr His Cys Leu Gly Val Asp Thr Arg Asn Ile  
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Thr Asn Arg Ser Asp Cys Val Ala Ala Asn Tyr Arg Trp Val His His  
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Lys Tyr Asn Phe Asp Asn Leu Gly Gln Ala Leu Met Ser Leu Phe Val  
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Leu Ala Ser Lys Asp Gly Trp Val Asn Ile Met Tyr Asn Gly Leu Asp  
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Ala Val Ala Val Asp Gln Gln Pro Val Thr Asn His Asn Pro Trp Met  
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Leu Leu Tyr Phe Ile Ser Phe Leu Leu Ile Val Ser Phe Phe Val Leu  
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Asn Met Phe Val Gly Val Val Val Glu Asn Phe His Lys Cys Arg Gln  
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His Gln Glu Ala Glu Glu Ala Arg Arg Arg Glu Glu Lys Arg Leu Arg  
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Arg Leu Glu Lys Lys Arg Arg Tyr Ala Gln Arg Leu Pro Tyr Tyr Ala

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1420

Ser Phe Val Leu Thr Ala Gln Phe Val Leu Ile Asn Val Val Val Ala

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Val Leu Met Lys His Leu Asp Asp Ser Asn Lys Glu Ala Gln Glu Asp  
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Ala Glu Met Asp Ala Glu Ile Glu Leu Glu Met Ala His Gly Ser Gly  
                                  1700                      1705                      1710

Pro Cys Pro Gly Pro Cys Pro Gly Pro Cys Pro Cys Pro Cys Pro Cys  
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Pro Cys Ser Gly Pro Arg Cys Pro Leu Val Thr Trp Gly Ser Gly Ala  
                                  1730                      1735                      1740

Met Asp Arg Glu Gly Gln Val Leu Glu Ala His Arg Glu Ser Pro Val  
                                  1745                      1750                      1755                      1760

Arg Thr Ala Ile Arg Cys Trp Thr Pro Arg Val Thr Cys Ala Gly Thr  
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Ala Ile Leu Gln Pro Arg Arg Pro Cys Gly Trp Thr Gly Ser Leu Glx  
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 Glu Gly Leu Pro Tyr Pro Ala Leu Ala Pro Val Val Phe Phe Tyr Leu  
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 Ser Gln Asp Ser Arg Pro Arg Ser Trp Cys Leu Arg Thr Val Cys Asn  
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 Pro Trp Phe Glu Arg Ile Ser Met Leu Val Ile Leu Leu Asn Cys Val  
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 115 120 125  
 Ala Val Glu Met Val Val Lys Met Val Ala Leu Gly Ile Phe Gly Lys  
 130 135 140  
 Lys Cys Tyr Leu Gly Asp Thr Trp Asn Arg Leu Asp Phe Phe Ile Val  
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 Ile Ala Gly Met Leu Glu Tyr Ser Leu Asp Leu Gln Asn Val Ser Phe  
 165 170 175  
 Ser Ala Val Arg Thr Val Arg Val Leu Arg Pro Leu Arg Ala Ile Asn  
 180 185 190  
 Arg Val Pro Ser Met Arg Ile Leu Val Thr Leu Leu Leu Asp Thr Leu  
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 Pro Met Leu Gly Asn Val Leu Leu Leu Cys Phe Phe Val Phe Phe Ile  
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 Phe Gly Ile Val Gly Val Gln Leu Trp Ala Gly Leu Leu Arg Asn Arg  
 225 230 235 240  
 Cys Phe Leu Pro Glu Asn Phe Ser Leu Pro Leu Ser Val Asp Leu Glu  
 245 250 255  
 Arg Tyr Tyr Gln Thr Glu Asn Glu Asp Glu Ser Pro Phe Ile Cys Ser  
 260 265 270

Gln Pro Arg Glu Asn Gly Met Arg Ser Cys Arg Ser Val Pro Thr Leu  
 275 280 285

Arg Gly Asp Gly Gly Gly Gly Pro Pro Cys Gly Leu Asp Tyr Glu Ala  
 290 295 300

Tyr Asn Ser Ser Ser Asn Thr Thr Cys Val Asn Trp Asn Gln Tyr Tyr  
 305 310 315 320

Thr Asn Cys Ser Ala Gly Glu His Asn Pro Phe Lys Gly Ala Ile Asn  
 325 330 335

Phe Asp Asn Ile Gly Tyr Ala Trp Ile Ala Ile Phe Gln Val Ile Thr  
 340 345 350

Leu Glu Gly Trp Val Asp Ile Met Tyr Phe Val Met Asp Ala His Ser  
 355 360 365

Phe Tyr Asn Phe Ile Tyr Phe Ile Leu Leu Ile Ile Val Gly Ser Phe  
 370 375 380

Phe Met Ile Asn Leu Cys Leu Val Val Ile Ala Thr Gln Phe Ser Glu  
 385 390 395 400

Thr Lys Gln Arg Glu Ser Gln Leu Met Arg Glu Gln Arg Val Arg Phe  
 405 410 415

Leu Ser Asn Ala Ser Thr Leu Ala Ser Phe Ser Glu Pro Gly Ser Cys  
 420 425 430

Tyr Glu Glu Leu Leu Lys Tyr Leu Val Tyr Ile Leu Arg Lys Ala Ala  
 435 440 445

Arg Arg Leu Ala Gln Val Ser Arg Ala Ala Gly Val Arg Val Gly Leu  
 450 455 460

Leu Ser Ser Pro Ala Pro Leu Gly Gly Gln Glu Thr Gln Pro Ser Ser  
 465 470 475 480

Ser Cys Ser Arg Ser His Arg Arg Leu Ser Val His His Leu Val His  
 485 490 495

His His His His His His His Tyr His Leu Gly Asn Gly Thr Leu  
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Arg Ala Pro Arg Ala Ser Pro Glu Ile Gln Asp Arg Asp Ala Asn Gly  
 515 520 525



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 50 55 60  
 Asp Glu Glu Gln Arg Val Pro Tyr Pro Ala Leu Ala Ala Thr Val Phe  
 65 70 75 80  
 Phe Cys Leu Gly Gln Thr Thr Arg Pro Arg Ser Trp Cys Leu Arg Leu  
 85 90 95  
 Val Cys Asn Pro Trp Phe Glu His Val Ser Met Leu Val Ile Met Leu  
 100 105 110  
 Asn Cys Val Thr Leu Gly Met Phe Arg Pro Cys Glu Asp Val Glu Cys  
 115 120 125  
 Gly Ser Glu Arg Cys Asn Ile Leu Glu Ala Phe Asp Ala Phe Ile Phe  
 130 135 140  
 Ala Phe Phe Ala Val Glu Met Val Ile Lys Met Val Ala Leu Gly Leu  
 145 150 155 160  
 Phe Gly Gln Lys Cys Tyr Leu Gly Asp Thr Trp Asn Arg Leu Asp Phe



165

170

175

Phe Ile Val Val Ala Gly Met Met Glu Tyr Ser Leu Asp Gly His Asn  
180 185 190

Val Ser Leu Ser Ala Ile Arg Thr Val Arg Val Leu Arg Pro Leu Arg  
195 200 205

Ala Ile Asn Arg Val Pro Ser Met Arg Ile Leu Val Thr Leu Leu Leu  
210 215 220

Asp Thr Leu Pro Met Leu Gly Asn Val Leu Leu Leu Cys Phe Phe Val  
225 230 235 240

Phe Phe Ile Phe Gly Ile Val Gly Val Gln Leu Trp Ala Gly Leu Leu  
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Arg Asn Arg Cys Phe Leu Asp Ser Ala Phe Val Arg Asn Asn Asn Leu  
260 265 270

Thr Phe Leu Arg Pro Tyr Tyr Gln Thr Glu Glu Gly Glu Glu Asn Pro  
275 280 285

Phe Ile Cys Ser Ser Arg Arg Asp Asn Gly Met Gln Lys Cys Ser His  
290 295 300

Ile Pro Gly Arg Arg Glu Leu Arg Met Pro Cys Thr Leu Gly Trp Glu  
305 310 315 320

Ala Tyr Thr Gln Pro Gln Ala Glu Gly Val Gly Ala Ala Arg Asn Ala  
325 330 335

Cys Ile Asn Trp Asn Gln Tyr Tyr Asn Val Cys Arg Ser Gly Asp Ser  
340 345 350

Asn Pro His Asn Gly Ala Ile Asn Phe Asp Asn Ile Gly Tyr Ala Trp  
355 360 365

Ile Ala Ile Phe Gln Val Ile Thr Leu Glu Gly Trp Val Asp Ile Met  
370 375 380

Tyr Tyr Val Met Asp Ala His Ser Phe Tyr Asn Phe Ile Tyr Phe Ile  
385 390 395 400

Leu Leu Ile Ile Val Gly Ser Phe Phe Met Ile Asn Leu Cys Leu Val  
405 410 415

Val Ile Ala Thr Gln Phe Ser Glu Thr Lys Gln Arg Glu Ser Gln Leu

420

425

430

Met Arg Glu Gln Arg Ala Arg His Leu Ser Asn Asp Ser Thr Leu Ala  
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Ser Phe Ser Glu Pro Gly Ser Cys Tyr Glu Glu Leu Leu Lys Tyr Val  
 450 455 460

Gly His Ile Phe Arg Lys Val Lys Arg Arg Ser Leu Arg Leu Tyr Ala  
 465 470 475 480

Arg Trp Gln Ser Arg Trp Arg Lys Lys Val Asp Pro Ser Ala Val Gln  
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Gly Gln Gly Pro Gly His Arg Gln Arg Arg Ala Gly Arg His Thr Ala  
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Ser Val His His Leu Val  
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&lt;210&gt; 34

&lt;211&gt; 1080

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&lt;213&gt; HUMAN

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&lt;211&gt; 359

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<400> 35

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20 25 30

Ala Ser Arg Arg Ser Ser Trp Asn Ser Leu Lys His Lys Pro Pro Ser  
35 40 45

Ala Glu His Glu Ser Leu Leu Ser Ala Glu Arg Gly Gly Gly Ala Arg  
50 55 60

Val Cys Glu Val Ala Ala Asp Glu Gly Pro Pro Arg Ala Ala Pro Leu  
65 70 75 80

His Thr Pro His Ala His His Ile His His Gly Pro His Leu Ala His  
85 90 95

Arg His Arg His His Arg Arg Thr Leu Ser Leu Asp Asn Arg Asp Ser  
100 105 110

Val Asp Leu Ala Glu Leu Val Pro Ala Val Gly Ala His Pro Arg Ala  
115 120 125

Ala Trp Arg Ala Ala Gly Pro Ala Pro Gly His Glu Asp Cys Asn Gly  
130 135 140

Arg Met Pro Ser Ile Ala Lys Asp Val Phe Thr Lys Met Gly Asp Arg  
145 150 155 160

Gly Asp Arg Gly Glu Asp Glu Glu Glu Ile Asp Tyr Thr Leu Cys Phe  
165 170 175

Arg Val Arg Lys Met Ile Asp Val Tyr Lys Pro Asp Trp Cys Glu Val  
180 185 190

Arg Glu Asp Trp Ser Val Tyr Leu Phe Ser Pro Glu Asn Arg Phe Arg  
195 200 205

Val Leu Cys Gln Thr Ile Ile Ala His Lys Leu Phe Asp Tyr Val Val  
210 215 220

Leu Ala Phe Ile Phe Leu Asn Cys Ile Thr Ile Ala Leu Glu Arg Pro  
225 230 235 240

Gln Ile Glu Ala Gly Ser Thr Glu Arg Ile Phe Leu Thr Val Ser Asn  
245 250 255

Tyr Ile Phe Thr Ala Ile Phe Val Gly Glu Met Thr Leu Lys Val Val  
260 265 270

Ser Leu Gly Leu Tyr Phe Gly Glu Gln Ala Tyr Leu Arg Ser Ser Trp  
275 280 285

Asn Val Leu Asp Gly Phe Leu Val Phe Val Ser Ile Ile Asp Ile Val  
290 295 300

Val Ser Leu Ala Ser Ala Gly Gly Ala Lys Ile Leu Gly Val Leu Arg  
305 310 315 320

Val Leu Arg Leu Leu Arg Thr Leu Arg Pro Leu Arg Val Ile Ser Arg  
325 330 335

Ala Pro Gly Leu Lys Leu Val Val Glu Thr Leu Ile Ser Ser Leu Lys  
340 345 350

Pro Ile Gly Asn Ile Val Leu  
355

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